

interesting paper on the Pali and Sanskrit texts by Prof. T. W. Rhys Davids. Judging from the other articles, this new journal should perform a useful service in clearly pointing out the true nature of Buddhism. In common with other religions, Buddhism has many extraneous local beliefs and practises grafted upon it from which it requires to be pruned. The foreigner too often does not distinguish between these two elements, and from this point of view alone the review will perform a useful task.

The brilliant work done by Prof. G. Elliot Smith on the mammalian brain is acknowledged by all anatomists, and they will eagerly look forward to the memoir (which is based on the examination of more than 400 human brains, and of an almost equally large series of simian cerebral hemispheres) that is shortly to be published as vol. ii. of the "Records of the Egyptian Government School of Medicine." A summary of the main conclusions is published in the *Anatomischen Anzeiger*, Band xxiv. p. 436. The most striking result of this investigation is the demonstration of the fact that the sulci called "calcarine" in most human and all simian brains respectively are not strictly homologous. The so-called "calcarine fissure" of the apes is a complete involution of the whole mesial part of the area striata, fossa striata occipitalis, whereas the similarly named furrow in the human brain consists in most cases of anterior and posterior parts which are genetically distinct, the anterior part being the anterior limiting sulcus of the 'mesial area striata, sulcus præstriatus, and the posterior part a mere depression in (not a complete infolding of) the mesial area striata, sulcus intrastriatus.

Those interested in human craniology are aware that Prof. Sergi, of Rome, has inveighed against the cephalic index, and has introduced a new nomenclature for describing skulls by inspection. Several English anthropologists recognise that the cephalic index has its uses and abuses, but there is an indefiniteness about Prof. Sergi's nomenclature, which besides is somewhat complicated, that prevents them from adopting the latter to the exclusion of the former method. As a matter of fact, they employ both systems, but only make use of the simpler terms introduced by the Italian anatomist. Dr. F. Frassetto has now applied Prof. Sergi's method to the anthropoid apes, and the following are his main conclusions. The skull of the adult chimpanzee is *byrsoides rotundus*, the less fully grown skull is *byrsoides cuneatus*; there is progressive reduction in the cephalic index, 88 to 70. The skull of the adult gorilla is *byrsoides asciformis*, while that of the young is *ellipsoides cuneatus*; there is a similar reduction in the cephalic index during growth, and the average breadth is less. On the whole the skull of the orang-utan is *sphaeroides* and *platycephalus*; the cephalic index varies from 91 to 75. Thus the Asiatic anthropoid tends to preserve the primitive brachycephaly, while the African forms, especially the gorilla, become dolichocephalic. The author directs attention to the essential brachycephaly of Asiatic man and the dolichocephaly of African man. *Pithecanthropus*, however, which he describes as *byrsoides asciformis*, "is a fossil form of African anthropoid found in Asia." This short but suggestive paper will be found in the tenth anniversary volume of the *Atti della Società Romana di Anthropologia* (Rome, 1904.) A. C. H.

INTERNATIONAL OCEANOGRAPHY.¹

THIS first instalment of the observations of the international scheme of deep-sea investigation proves conclusively the unique value of the undertaking, launched amid many difficulties, both for the advancement of the purely scientific interests of marine zoology and meteorology, and for their practical applications to matters of fisheries and weather forecasting. It contains the numerical results of the observations made during August, 1903, by ships sent out specially by no less than ten countries—Belgium, Germany, Denmark, England, Finland, Holland, Norway, Russia, Sweden, and Scotland. The classification is that of the council, and we may ignore any question as to the international relations of Sweden and Norway, Finland and

¹ "Conseil permanent international pour l'Exploration de la Mer." *Bulletin des Résultats acquis pendant les Courses périodiques*, No. 1, Août, 1903.

NO. 1806, VOL. 70]

Russia, or England and Scotland, and congratulate ourselves on the fact that so many nationalities have been found to agree to meet on neutral territory and to engage in a uniform scheme of scientific research, as of happy omen.

The *Bulletin* is divided into four sections, A, B, C and D. Section A consists of a table of observations of the condition of the atmosphere as to its temperature and movement, and of the condition of the surface water as to its temperature and salinity. The distributions disclosed by the data are shown graphically on two maps, one on a scale of 1 : 18,000,000, which includes the whole area, the Baltic, the North Sea, the North Atlantic and the Arctic, and another, on a scale of 1 : 6,000,000, giving the North Sea, the English Channel, and the Baltic entrance, in more detail. The maps contain much that is of supreme interest, but it is greatly to be regretted that advantage has not been taken of the skill and enthusiasm of the commanders and officers of ships crossing the Atlantic in lower latitudes to extend the maps into the region in which the explanation of facts they show is to be looked for.

In Section B we find the observations of temperature and salinity at various depths. The salinities are determined by chlorine titration of water samples collected, and from these and the observed temperatures the specific gravities *in situ* have been computed. These tables profess a high degree of accuracy—temperatures to hundredths of a degree, salinities to two places of decimals, and specific gravities, in some cases, to six places—but it seems hardly necessary to inquire whether all the figures given are significant or not, or, if they are, whether it is worth while to trouble about the necessary refinements when observations taken from ships, the positions of which are scarcely known to within a mile or two, on any day during a month, are lumped together as if they were absolutely simultaneous. For in the end we obtain a series of sections which is absolutely invaluable. Discussion of these sections is impossible in the space available here, and in any case it will be better delayed until further bulletins provide material for comparison. We may, however, instance as of special interest the sections across the Færøe-Shetland Channel furnished by the Scottish Fishery Board, and the parallel section from Bergen to Iceland of the Danish and Norwegian observations. We are now in possession of a number of sections in this region for different years, and the constant change in the relation of the northward and southward moving streams is a phenomenon of ever-increasing interest.

Section C contains the results of gas analyses of a number of the samples collected by the German, Dutch, and Danish vessels. It is to be hoped that the other nationalities will join in this very important part of the work. The last section is devoted to tables showing the distribution of plankton.

It is worth noting that four of these bulletins will constitute one volume, for which the subscription is one pound.

H. N. D.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—Mr. Beck, master of Trinity Hall, has been elected Vice-Chancellor for the ensuing academical year.

Prof. Howard Marsh has been approved for the degree of Master of Surgery.

The Vice-Chancellor has published to the Senate a resolution unanimously passed by the Association of Chambers of Commerce of the United Kingdom supporting the recent communication from the council of the Royal Society, and urging that steps be taken to "ensure that a knowledge of science is recognised in schools and elsewhere as an essential part of general education."

The special syndicate appointed for the purpose report in favour of the university granting a diploma in mining engineering to members of the university who have completed six terms' residence, and have pursued an approved course of theoretical and practical study in the subject.

Prof. Ewing's Rede lecture, on the structure of metals, will be delivered in the anatomy and physiology lecture room on June 11 at 11.30 a.m.

Prof. W. H. Perkin, F.R.S., of Manchester, has been appointed an elector to the chair of chemistry and to the Jacksonian professorship.

Dr. L. Humphry, Dr. S. West, Dr. W. Hale White, and Dr. J. Rose Bradford, F.R.S., have been appointed examiners in medicine; Dr. Handfield-Jones and Dr. Herman, examiners in midwifery; Mr. Clinton Dent, Mr. Edmund Owen, Mr. Mansell Moullin, and Sir Hector Cameron, examiners in surgery for medical degrees.

Two portfolios of valuable drawings, illustrating ophthalmology and otology, have been presented to the university by Dr. Ole Bull, of Christiania. They will be exhibited at Oxford next month by Prof. Clifford Allbutt.

SIR WILLIAM H. WHITE, K.C.B., F.R.S., will open the new workshops, laboratories, &c., at the Merchant Venturers' Technical College, Bristol, on Wednesday, June 29.

At a meeting of the council of University College, London, on Monday, June 6, Dr. Gregory Foster was appointed principal of the college as from September 1 next, in succession to Dr. Carey Foster, who had intimated his intention not to seek re-election on the expiration of his office at the end of August. Mr. Tansley was appointed lecturer in plant anatomy for a term of three years. Mr. E. C. C. Baly was re-appointed lecturer in spectroscopy for a term of three years.

It is announced in *Science* that the Bill appropriating 50,000*l.* for the erection of a building for the College of Agriculture at Cornell University has been signed. From the same source we learn that Mr. Eugene N. Foss has given 10,000*l.* to the University of Vermont for the million dollar fund which the graduates of that college are trying to raise to mark the centenary of the institution; and that the will of the late Mr. Solomon Loeb, of New York City, has given 2000*l.* for the Chemical Laboratory of the New York University, 2000*l.* for the Hebrew Technical Institute, and 1000*l.* to the American Museum of Natural History.

In a copy just received of the Johns Hopkins University *Circular*, we notice a feature that might well be copied by other institutions of a similar kind, viz. the publication of "Notes in Biology," edited by Prof. Brookes, and "Notes in Mathematics," edited by Prof. F. Morley. A very useful purpose is served by the publication of such "notes" in a university journal, which would hardly be a suitable medium for the detailed exposition of the results of lengthy researches. In the biology notes the body cavities and nephridia of the *Actinotrocha* are discussed by Dr. R. P. Cowles, while the mathematical notes deal with linear correspondences, the orthic cubic curve, and the construction of quadric polarity in space.

THE North of England Education Conference, which met for the first time in Manchester in January, 1903, and held its second meeting in Leeds in the early part of the present year, is to meet on the next occasion in Liverpool. The first meeting of the executive committee appointed to make arrangements for the next meeting of the conference was held at Liverpool on Friday, June 3, when Alderman W. Oulton, chairman of the Liverpool Education Committee, was appointed chairman of the executive committee, and Mr. E. M. Hance and Mr. W. Hewitt were appointed joint secretaries. It was decided that the conference should be held on Friday, January 6, and Saturday, January 7, of next year, and a general purposes subcommittee was appointed to make arrangements as to the subjects for papers and discussion.

A PUBLIC meeting of residents of the central part of Calcutta was held on May 4, the *Pioneer Mail* states, with the object of promoting the advancement of scientific and industrial education among Indians. In opening the meeting, Mr. Norendro Nath Sen remarked that a lakh of rupees was required annually, to be devoted to scholarships for deserving students to enable them to proceed to England, America and Japan for the study of the industries and arts

of those countries. The marvellous progress of Japan, the speaker continued, is due entirely to education in this direction. The people of India cannot be too grateful to the Government of India for providing scholarships, but the Government should not be allowed to carry the burden alone. It is left to the residents to develop and complete the work begun by the Government, and it is for this purpose that the movement has been started. The formation of local associations such as this one in Calcutta should have an excellent effect on scientific and technical education in India.

It has for some time past been a matter of comment that while American universities, and in several cases foreign ones—such as the University of Leyden—have frequently devoted considerable sums of money to the endowment, and in some instances to the separate publication, of scientific transactions, our English universities have not only been unable to subsidise the publication of researches, but have in most cases even failed to give their staffs sufficient leisure for the efficient prosecution of original work. The appearance of a paper by Prof. Karl Pearson on mathematical contributions to the theory of evolution, bearing on the title-page "Department of Applied Mathematics, University College, University of London—Drapers' Company Research Memoirs," is significant in more ways than one. It represents the fact that, probably for the first time, a City company has given an endowment of 1000*l.* to a university for the furtherance of research pure and simple, and further it indicates that mathematical research is at last beginning to receive public recognition. The present paper deals with the theory of contingency and its relation to association and normal correlation.

THE attention of the reader who is interested in the teaching and development of mechanics and mathematics is directed to an important address by Prof. A. Sommerfeld, of Aachen, on "The Scientific Results and Aims of Modern Applied Mechanics," of which an abridged translation, by Mr. R. M. Milne, has appeared in the *Mathematical Gazette*. The address is a powerful statement of the now prevalent view that in teaching mechanics the foundations must be securely laid by systematic experimental work on the part of the students themselves, for whom suitable facilities must be generously provided; it is also a plea for a closer attention on the part of mathematicians to the problems of practical mechanics. In this country these doctrines have long been associated with the name of Prof. Perry, F.R.S., and one of the latest phases in the movement is the reform of the teaching of elementary mathematics. Prof. Sommerfeld states that most of the German high schools now possess richly equipped laboratories for research and instruction in mechanics, and that the value of such work is generally recognised and greatly appreciated. He also describes the nature of some of the experiments and investigations that are carried out in these laboratories.

It is satisfactory that there seems to have been a general agreement among the speakers at a recent meeting of the National Association of Manual Training Teachers—held to discuss the references to manual training in schools in the reports of the Mosely Educational Commission—as to the need in all schools for practical work conducted on scientific lines. Mr. Mosely said that the broad-minded way in which American engineers tackled the problems brought before them was what first excited his interest in the system of education in the United States. Mr. Mosely agrees with Prof. Armstrong that it is the fourth "R" which makes all the difference between the educational results in the United States and in this country. American teachers are right in giving more attention to the teaching of how to reason in a scientific manner than is common in English schools. Prof. Armstrong, who also spoke at the meeting, deprecated the erection of what he called "a magnificent metal workshop here and a magnificent wood workshop there," and said a large supply of costly machinery of one kind is unnecessary. A variety of occupations rendered possible to the boys is what is wanted, and the manual training thus provided should be related to local requirements.